The wealth effects of labor representation on the board – evidence from German codetermination legislation[*]

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Abstract

Codetermination, i.e. the participation of labor in the supervision and strategic positioning of the firm, is prevailing in many of the continental European countries. However, for several decades now it has been an open question whether it provides any benefits to corporations and their shareholders. The fact that it must be mandated by law has often been seen as an argument against its usefulness. Due to limited data availability and methodological problems, empirical studies have been unable to resolve the question, so far. With two new hand-collected datasets and the use of event-study methodologies I provide the first empirical evidence that the initiation of codetermination in firms is associated with negative wealth effects for shareholders. By employing a regulatory event study at the time when the Codetermination Act of 1976 was passed the results suggest that only companies which were affected the most, i.e. in which 5 or more additional labor representatives took up board seats experienced negative announcement returns. I also analyze abnormal returns at announcements on board structure changes in the most recent time period (1998-2008). The results show large negative wealth effects if labor representatives join a board that previously had not been codetermined. I find the opposite (positive) effect of almost equal size if labor representatives leave a board that will not be codetermined anymore in the future. The results indicate that only the initial entry of labor representatives to the board matters. Once labor representatives are on the board a further increase in their number does not lead to additional significant negative abnormal returns. The evidence suggests that the initial implementation of codetermination poses significant coordination and negotiation costs to the firm and its shareholders.

1. Introduction

Codetermination, i.e. the participation of labor in the supervision and strategic positioning of the firm, is puzzling. It is prevalent in many countries in continental Europe but its benefits to the corporation have not been proven, yet. In fact, even after thirty years the Jensen and Meckling question is still unanswered: "If codetermination is beneficial to both stockholders and labor, why do we need laws which force firms to engage in it?" (Jensen & Meckling, 1979, p. 474). The few empirical studies that are available usually suffer from a lack of data or had to rely on biased empirical methods. In this paper, I provide unique event-study evidence which suggests that codetermination in Germany significantly reduces shareholder wealth.

Among the European countries, Germany has the highest number of codetermination laws and different means of labor representation in the firm (Niedenhoff, 2005). Different types of Codetermination have been introduced in Germany over the years. Since 1976, when the Co-determination Act was passed, all firms with more than 2,000 domestic employees must grant half of the board seats to labor. At the time of the passage of the Codetermination Act it was expected that about 650 corporations would be affected by the new law. In total, over 7 million workers would then be governed by a parity-codetermined supervisory board, representing over one-quarter of the total work force (Benelli et al., 1987). Today, parity-codetermination applies to roughly 760 companies in Germany. Except for Slovenia, Germany is also the only country with parity-codetermination in Europe (Niedenhoff, 2005). In the initial government bill from 1976 it was stated that "companies will only face minor additional costs, mainly caused by the election procedures of labor representatives to the supervisory board".[1] However, the general finding that the majority of supervisory board decisions in Germany are made unanimously (Gorton & Schmid, 2004) might indicate potential costs of coordination and negotiation which may result from bargaining between capital and labor. In a recent survey conducted by the Cologne based think tank "Institute of the German Economy" (*Institut der deutschen Wirtschaft*) large corporations which are subject to parity-codetermination mention it more often as competitive disadvantage than smaller firms with only one-third labor participation on the board. In addition parity-codetermined firms see the reduction in supervisory board size significantly more often as an effective way to reduce the costs of the board compared to one-third parity determined firms (Stettes, 2007).

From an academic view, the value impact of Codetermination is not clear. Except for Jensen and Meckling (1979), most of the theoretical studies argue for a positive effect of Code-

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[1] BR-Drs. 200/74, parliamentary archive of the German Bundestag.

termination on the value of the firm. In fact, Fama and Jensen (1983) suggest that the board's most influential members are its internal managers because they have valuable specific information about the organization's activities. Since the executives are not allowed to sit on the supervisory board in Germany, employee representatives could embody the only group of insiders on the board that has specific knowledge about the operations of the firm. The beneficial role of employee representatives as firm insiders might be particularly important in firms with highly complex investment projects that are difficult to assess for outsiders (Raheja, 2005)

Implementing empirical tests on German codetermination is challenging. Whether a firm is codetermined in Germany is determined by its number of domestic employees and, therefore, is highly correlated with firm size. Accordingly, the results have been ambiguous, so far. A few studies employ a short-term or long-term event-study to compare firm performance parameters from before and after the enactment of the Codetermination Act in 1976. They all have in common that they do not find negative effects on parity-codetermined firms after the introduction of the Codetermination Act in 1976. Baums and Frick (1999) and Benelli, Loderer and Lys (1987) find that parity-Codetermination neither increases nor reduces shareholder wealth. Renaud (2007) finds that the introduction of parity-Codetermination in 1976 has further increased both productivity and profitability in companies which were subject to the Codetermination Act compared to firms which remained to have one-third of employee representatives on the board. Another strand of empirical studies employs cross-sectional analyses. The main focus has been on comparing estimated production functions or other types of performance measures of parity codetermined and non-(parity) codetermined firms. In contrast to tests on panel datasets, the cross-sectional analyses do find significant but ambiguous effects. While FitzRoy and Kraft (1993) and Gorton and Schmid (2004) find evidence for a negative impact of parity-Codetermination on firm performance and firm value Fauver and Fuerst (2006) find a positive impact at least in the medium range of employee representation on the board. However, whether a firm is codetermined or not in Germany is highly correlated with firm size so that most of the studies suffer from this 'size effect'.[2] Accordingly, empirical studies on German codetermination have suffered from a lack of data, biased methodologies, or both.

With two hand-collected datasets and the use of the most recent methodologies, I provide new empirical evidence on the wealth effects of employee representation on the board. Specially, the data allows me to test whether mere changes in board size, changes in the number

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[2] This is not to be confused with the 'size effect' in empirical asset pricing as found by Banz (1981).

of employee representatives on the board, or both, have a significant effect on the value of the firm. I approach this research question from two angles. First, I employ a regulatory event study to analyze at two announcement dates the stock price reaction in firms which were affected by the Codetermination Act of 1976. I find negative abnormal returns for firms that were most affected by the new law, i.e. firms in which 5 or more labor representatives newly join the board. The results represent the initial market reaction to the passage of the Codetermination Act. Over time, however, the effect of codetermination might have changed. Firms may have learned to better use codetermination for their benefit. They may also have established mechanisms which either neutralize negative effects or further enhance the positive effects of codetermination.

Therefore, in a second analysis I employ standard event study methodology to examine the market reaction at announcements about changes in the supervisory board size and composition in the most recent period (1998-2008). Based on the German Stock Corporation Act (*Aktiengesetz*) companies have to make an announcement when their board structure changes. The results show a large and significantly negative effect on firm value when employee representatives take up seats on the supervisory board for the first time. The results are further strengthened by the fact that the symmetric decrease in the number of employee representatives so that the board will not be codetermined in the future, leads to an almost equal significant positive stock price reaction. The results indicate that only the initial entry of labor representatives to the board matters. Once labor representatives are on the board, a further increase in their number does not lead to additional significant negative abnormal returns. The findings suggest that codetermination poses significant initial costs of coordination and negotiation to the shareholders, but only negligible marginal costs once codetermination is in place. The findings can also be interpreted in the way that the implementation of codetermination on the firm-level changes the objective function of the firm.

In the next section I provide an overview on the institutional setting in Germany by describing the different codetermination laws that are currently in place. Section 3 covers the regulatory event study to examine the wealth effects of the Codetermination Act of 1976. It includes descriptions of the data, the hypotheses, and the regression results. Section 4 analyzes the announcement returns to changes in supervisory board structure in contemporaneous times (1998-2008), including the data description and the regression outcome. Section 5 concludes.

2. Institutional background

German companies are governed by a two-tired board structure, consisting of the management board and the supervisory board. The management board (*Vorstand*) consists of the executives, or officers, of the firm. It is responsible for approving the annual accounts and the firm's long-term strategy as well as the running of daily business activities (Franks and Mayer, 2001). Functionally, the supervisory board (*Aufsichtsrat*) can be seen as the equivalent to the board of directors in US firms. However, its structure, i.e. its size and composition, is highly regulated by law.[3] For example, no officers, including the chief executive officer (CEO), are allowed to sit on the board. In addition, in certain types of companies employees are granted seats on the supervisory board. The specific details are regulated in four main legal Acts.[4] The base law for publicly listed firms is the Stock Corporation Act (*Aktiengesetz*, AktG). It states that the supervisory board must consist of at least 3 members (Art. 95). The maximum board size a firm can voluntary adopt depends on the nominal capital of the company. For a nominal capital less than 1,500,000 EUR, the maximum size is 9, less than 10,000,000 EUR, the maximum size is 15, and more than 10,000,000 EUR, the maximum is 21. The Stock Corporation Act is subordinated to three other Acts which, depending on the size and the industry of the firm, regulate the exact size and composition of the supervisory board. The three respective Acts are: the Montan-Codetermination Act of 1951 (*Montanmitbestimmungsgesetz*) and its amendments, the Works Constitution Act (*Betriebsverfassungsgesetz*) of 1952 and its amendments, and the Codetermination Act (*Mitbestimmungsgesetz*) of 1976.

The Montan-Codetermination Act of 1951 applies to all companies in the iron, coal, and steel industry (= *Montan*) with more than 1,000 employees and which are either in the form of a stock corporation (*Aktiengesellschaft*) or of a limited company (*Gesellschaft mit beschränkter Haftung*). The Montan-Codetermination Act requires parity among shareholder and labor representatives on the supervisory board. Depending on the size of the company, the size of the supervisory board is set to consist of 11, 15, or 21 members. The last member, a neutral member, is not allowed to be a shareholder or labor representative, nor is she allowed to be a union member or to hold shares of the company. In the year 1951, 105 companies were af-

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[3] In this paper, board structure refers to the size and the composition of the supervisory board. Composition regards the division of board seats among shareholder and employee representatives.
[4] In what follows, the main reference has been the respective laws which I also cite. However, papers with similar descriptions but different levels of detail about the forms of Codetermination in Germany are, among others, Benelli, Loderer and Lys (1987), FitzRoy and Kraft (1993), Gorton and Schmid (2004).

fected by the *Montan*-Codetermination Act. This number declined to 68 companies in 1969 and to 31 companies on 31 December 1986.[5]

The Works Constitution Act of 1952 requires one-third labor representation on the supervisory board in all limited companies and corporations which are not subject to Montan-Codetermination or which are not family businesses (Art. 76 Sec. 1).[6] Stock corporations founded after 10 August 1994 and which are not family businesses have to grant one-third of the supervisory board seats to labor representatives only if the number of employees is more than 500 (Art. 76 Sec. 6).

The Codetermination Act of 1976 extends a revised version of the Montan-Codetermination Act to all other industries in Germany. The Codetermination Act requires all companies with more than 2,000 domestic employees to grant half of the supervisory board seats to labor. The size of the supervisory board depends on the number of domestic employees. Three intervals must be differentiated. In companies with domestic employees between 2,000 and 10,000, between 10,000 and 20,000, and more than 20,000 employees the sizes of the supervisory board are 12, 16, and 20, respectively. To break voting ties, the supervisory board chairman who is elected by the shareholder representatives has a second vote. In addition, at least one member of the labor representatives must be from the middle management (*leitender Angestellter)* (Gorton & Schmid, 2004).

To differentiate among the different types of codetermination, in this paper I will refer to codetermination as the general participation of labor representatives on the supervisory board. I distinguish between "Montan-Codetermination" based on the Montan-Codetermination Act, "one-third Codetermination" based on the Works Constitution Act, and "parity-Codetermination" based on the Codetermination Act.[7] Taking all three Codetermination laws together, all publicly listed companies in Germany must have labor representation on the board. The only exception are firms that have fewer than 500 employees and which are founded after August 10, 1994, the effective date of the law known as the Small Company and Deregulation Act (*Gesetz fur kleine Aktiengesellschaften und zur Deregulierung des Aktienrechts*) (Fauver & Fuerst, 2006, p. 675). Generally, any of the three Codetermination Acts only specifies minimum requirements. The only maximum requirement for board size is

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[5] Information was provided by the Federal Ministry of Labour and Social Affairs (*Bundesministerium für Arbeit und Soziales*) Referat IIIa 5 Gleichbehandlung im Arbeitsrecht, Unternehmensmitbestimmung 53107 Bonn.

[6] In 2004 the Works Constitution Act was revised and renamed to 'One-third Participation Act' (*Drittelbeteiligungsgesetz*).

[7] The tie-breaking vote of the shareholder representative supervisory board chairman and the employee representative from the middle management has led some scholars to speak of 'almost-parity' (FitzRoy & Kraft, 1993). To differentiate the general expression 'Codetermination' which is common in the literature, from the one-third Codetermination which is common in Germany, the term 'parity-Codetermination' has also been introduced (Benelli et al., 1987).

specified in the Stock Corporation Act and is not to exceed 21 members. The information is summarized in Table I.

3. The value impact of the Codetermination Act of 1976

3.1 Assumptions about expectations on board structure changes

As was already presented in Table I, before 1976 all non-Montan-firms in Germany had to have a supervisory board consisting of 3 members at least, and of 21 members at the maximum. Employee representatives had to take up one-third of the board seats. The passing of the Codetermination Act of 1976 introduced parity-Codetermination to all non-Montan-firms in Germany with more than 2,000 domestic employee. Therefore, it is possible to measure the impact of employee representation on the board by looking at the stock price reaction at various announcements leading to the passage of the Codetermination Act. As I will show below, most of the relevant announcements occurred between the end of 1975 until the Codetermination Act was passed in parliament in March 1976. By knowing the number of domestic employees in non-Montan-companies at the end of 1975, investors must have been able to form expectations how companies would be affected by the new law. By conducting an event study around the dates when new information about the Codetermination Act reached the market, it is possible to test whether wealth effects were associated with firms that changed from one-third employee board representation to one-half.

A natural way to perform the analysis is to group firms according to their *expected* change in board size and number of employee representatives. To calculate the expected change, the board structure as well as the number of domestic employees prior to the Codetermination Act, i.e. in 1975, must be known. In addition, three assumptions must be made on investors' believes about the future board structure after the Codetermination Act in 1976. First, if the firm's prior board size had been below the new minimum board size required by the Codetermination Act, I assume that investors expected the new board size to exactly fulfill the new minimum requirement. Second, if the board size had been at the new minimum requirement, I assume board size to remain the same so that only the number of employee representatives would adjust to be half of board size. For example, if board size had been 12 and the new minimum is 12, I assume board size to remain the same and only the number of employee representatives increases from 4 to 6.Third, if the board size had been above the new minimum requirement even before the Codetermination Act, I assume board size to adjust to the next closest of the three board sizes prescribed by the Codetermination Act. For example, if board size had been 15 and the new minimum requirement of the Codetermination Act based

on the firm's number of domestic employees was 12, I assume board size to go to 16 and the number of employee representatives from 5 to 8. One could argue that the adjustment should not be based on board size but on the number of employee representatives. However, there is anecdotal evidence that firms mainly focus on board size and choose the size that is most suited to the characteristics of the firm.[8]

It can also be argued that the mere fact of being affected by the Codetermination Act has had an effect on firm value independent of the number of additional employee representatives that might finally join the board. Certainly, by treating affected firms as one group, the incremental change in board size and number of employee representatives due to the Codetermination Act will differ substantially. As I do not expect any significant results from this test, I do perform it but will only briefly discuss the results in the appropriate section without reporting the regression outcomes.

Since most of the firms in the German stock market are affected simultaneously by the Codetermination Act, i.e. they share the same event dates, a regulatory event study must be employed instead of the standard Brown and Warner (1985)event study methodology. The details are explained in the next section.

3.2 Methodology and event date definition

3.2.1 Regulatory event study

The analysis of wealth effects based on regulatory events requires several adaptations to the assumptions of the traditional Fama *et al.* (1969) event study methodology as highlighted by Binder (1985a). First, there are multiple known and unknown event dates without one single well-defined announcement. Due to the ongoing negotiations as part of the political process it is not accurately known when expectations change. The imprecision of event dates can greatly reduce the power of event studies (Brown & Warner, 1985). Second, regulations affect firms in the same industry at the same time which leads to cross-sectional dependence in the excess returns, commonly referred to as "*event clustering*" (Brown & Warner, 1985).

The multivariate regression model (MVRM) based on Zellner's (1962) seemingly unrelated regressions (SUR) has been suggested as a solution to event clustering in regulatory event studies. It allows the disturbances to be contemporaneously correlated across equations

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[8] For example, the company "Mueller – Die lila Logistik AG" used to have a supervisory board which only consisted of three shareholder representatives. On 08 May 2004 in their invitation letter to the Annual General Meeting, the company announced that due to passing the 500 employee level one-third of the supervisory board seats must be taken up by employee representatives. The management and supervisory board suggested that in light of the increase in responsibility for the supervisory board which goes in hand with the growth of the firm, board size be increased from 3 to 6 members, 2 of which would be employee representatives.

instead of being IID. In addition to dealing with event clustering, the MVRM allows the testing of restrictions across equations as well as the testing of joint hypotheses regarding the event periods over time (Binder, 1985b). Empirical studies that have employed the MRVM in an event study framework are, among others, Schipper and Thompson (1983) on merger regulation between 1968-1970; Smith, Bradley, and Jarrell (1986) on U.S. oil price regulation in 1973; Cornett and Tehranian (1990) on the Garn-St. Germain Depository Institutions Act of 1982; Karpoff and Malatesta (1995) on Pennsylvania's 1990 antitakeover law; Wagster (1996) on the 1988 Basle Accord; and Wagster (2007) on the Canadian Deposit Insurance Corporation Act of 1967.

Another advantage of the MVRM is that it allows estimating abnormal returns for each firm separately. This is especially useful if coefficient signs are expected to differ across firms (Binder, 1985b). In the analysis I am proposing, I expect coefficient signs to differ across portfolios of firms based on their expected changes in supervisory board structures. Instead of estimating parameters for each firm separately, I construct portfolios based on the expected change in board size or number of employee representatives on the board. The equal weighted portfolio return is used as dependent variable. The methodology most closely related to the one I am using in this paper is presented in Karpoff and Malatesta (1995).

Traditionally, SUR are efficiently estimated under GLS. In order to control for heteroskedasticity, I apply an Eicker-Huber-White-sandwich covariance estimator to the set of portfolio returns estimated by OLS, however. In the light of potential heteroskedasticity, the standard errors will be valid but the coefficients are less efficient than under the GLS estimation.

To accurately perform a regulatory event study, it is of utmost importance to identify unexpected event dates. In the next section I describe the announcements that have been selected for this study.

3.2.2 Event definition

In a political negotiation process there is usually more than one single announcement and the event period can span several months or even years. The case of the Codetermination Act is a special one. Already in 1962 when the Stock Corporation Act was revised, the German Federation of Trade Unions (*Deutscher Gewerkschaftsbund*) prepared a bill which requested parity-Codetermination for all companies in Germany.[9] The whole sequence of events that led to the passage of the Codetermination Act of 1976 is displayed in the Appendix A.1. To identify

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[9] Hans-Boeckler Stiftung (http://www.boeckler.de, accessed 24 January 2008).

the major event dates in the political process I consulted the German Bundestag (1978).[10] Based on the events provided there, I conducted a newspaper search in the *Zeitungs-Index*, an index which lists the newspaper headlines of the major newspapers and retrieved the most important newspaper articles. I also went through the online archive of the German weekly newspaper *Die ZEIT*. Based on all potential announcement dates identified in these sources, I only include those events that are first in a sequence of announcements, that are free from conflicting information, and in which the news can be judged as *unexpected*. I count news as unexpected if no prior newspaper article had already speculatively but correctly predicted the outcome or if the outcome was opposite to what was previously reported/expected. In the following, I describe the 2 announcements that have been identified and that are used in this study.

1) Tuesday, 22 January 1974: the coalition parties SPD and FDP, which formed the government at that time, present for the first time the main components of their draft for the extension of parity-Codetermination to all industries. Based on newspaper headlines in the *Zeitungs-Index*, the first mentioning of the government bill was on 23 January 1974.[11]

2) Thursday, 18 March 1976: debate and passing of the Codetermination Act in the German Bundestag with 389 members of parliament in favor and 22 members against it.

3.3 Data and sample construction

Stock returns in Datastream are available from 03 January 1973. I only include firms that have stocks trading in Germany, whose stock prices are adjusted for stock-splits and capital changes and include reinvested dividends, and that went public before 01/01/1974. The available 165 firms are used to collect information on board size, employee representatives on the supervisory board, and number of employees in the year 1975 from Hoppenstedt's *Handbuch der deutschen Aktiengesellschaften* (henceforth *Hoppenstedt*). Because of imprecision two adjustments have to be made to the Datastream data. First, the historical company names provided by Datastream do not seem to reach as far back as 1975. Whenever I am unable to find a company in *Hoppenstedt* based on the name provided in Datastream, I do an internet search to identify the historical company name. Nevertheless, information for 20 firms could not be found in *Hoppenstedt*. Second, during the sample period Datastream does not identify holidays on which shares are not traded. Unfortunately, the non-trading patterns with stale prices

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[10] Specifically, I made use of the law documentation provided by the parliamentary archive of the German Bundestag which includes all published materials belonging to that law, such as the government bill, discussions in the plenum, council reports).

[11] Newspaper article, „Wortlaut des zwischen der FDP und SPD ausgehandelten Kompromisses in der Mitbestimmungsfrage", Frankfurter Allgemeine Zeitung, 23 January 1974, No. 19, p, 16.

and zero returns are very scattered and not consistent across all stocks. In order to exclude at least the most obvious non-trading holidays, I exclude days on which simultaneously a zero return on the index occurs with zero returns across all stocks when the day was an official public holiday.

The *Hoppenstedt* data requires three refinements. First, in some firms the board size as reported by *Hoppenstedt* does not fulfill the regulatory requirements. In 1975, the board size must have been divisible by three in all companies. In most of these cases the number is smaller by one, and in a few cases larger. The deviation might be either due to reporting errors or data collection errors. Most likely, however, one board member might have left shortly before the supervisory board size was recorded by *Hoppenstedt* and the position had not been refilled, yet. In these cases, I adjust to the number which is closest to fulfilling the requirement of being divisible by three. For example, when the board size is 7, I adjust it to 6. When it is 14 I adjust to 15 and so on. However, the number of employee representatives is never more than 1/3 of board size. Therefore, when the number of employee representatives is given, I adjust board size to be three times as large. For example, in one case board size was reported to be 7 but the board included three employee representatives. Accordingly, I adjust board size to 9. As a robustness check, I also compare the board size number with the previous and following year. Second, a similar problem arises with the number of employee representatives on the board. Since I have already made adjustments to the board size, I report one third of that size as employee representatives in companies which are not Montan-companies.[12] Third, I identify Montan-companies by using the book by Hempel (1969) as a reference in which some of the companies are listed. Montan-companies must have a supervisory board size of 21 or 15. If firms with such board size were not mentioned in the book, I also search in the internet for their firm histories and report them accordingly.

Based on the selection criteria in Datastream, 172 firms with return data can be downloaded. Despite having selected Germany as a market, 5 firms are not listed in Germany but London or New York. Two firms have two shares trading of which I only keep the major one based on Datastream definition, leaving 165 firms. For the sample construction, I require data on board structure and number of employees in 1975. I exclude 25 firms for which either or all of the information was missing, leaving 140 firms. The distribution of supervisory board structures in 1975 of these 140 firms is displayed in Panel A of Table II. 4 *Montan*-companies

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[12] The only exception granted in the law is family businesses with fewer than 500 employees. In which no employee representatives are necessary on the board. There is only one firm in the sample with less than 500 employees for which I made an adjustment to the number of employee representatives from 0 (as reported by Hoppenstedt) to 4. I checked that firm and it is not owned by a family.

with a supervisory board size of 21 and 10 employee representatives existed and are displayed in the framed white cell in the very far right corner of Panel A. All other companies fell under the Works Constitution Act with one-third employee representation on the board, displayed in grey diagonally in the matrix. The ratio of mean board size to mean number of labor representatives on the board was 11.14 to 3.94 and the median ratio 9 to 3.

Panel B shows the expected distribution of board structures after the Codetermination Act, based on the number of employees in the firm in 1975 and the previous board structure, as explained above. Since Montan-companies were not affected by the Codetermination Act, the four firms remain in the far right corner of the matrix in Panel B. The companies that remained governed by the Works Constitution Act are displayed in grey on the first diagonal. As an additional feature to Panel A, companies with more than 2,000 employees are now governed by the Codetermination Act, requiring one-half employee representation on the board. 78 companies were expectedly affected (56%) and they are highlighted in black to form a 'second diagonal'. The graphical illustration shows that the introduction of three new minimum requirements for board sizes (12, 16 and 20) by the Codetermination Act shifted the distribution of board structures shifted to the south-east direction. The ratio of mean expected board size to mean expected number of labor representatives on the board has changed to 13.21 / 5.94 and the median ratio to 12 / 6. Compared to Panel A, this indicates that board size did not significantly increase due to the Codetermination Act, but labor board representation doubled.

The board size numbers before but even after the Codetermination Act show great similarity to the US where board size was found to range from 6 to 24 members with mean board size of 12.25 (Yermack, 1996).

It must be noted that these numbers represent expectations based on the number of firm employees reported in *Hoppenstedt*. For the application of the Codetermination Act, only the number of domestic employees matters. *Hoppenstedt* data usually does not differentiate into domestic and international employees so that their employee data can only serve as a proxy.[13]

Based on the information displayed in Panel B of Table II, market participants could have adjusted their portfolio holdings if they expected any positive or negative effects by the Codetermination Act. I test this supposition in the next section.

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[13] Comparing the numbers with a small sample provided by the Monopolies Commission (*Monopolkommission*) which does only report the number of domestic employees, I do find large deviations.

3.4 The regression model for the regulatory event study

By applying the MVRM based on Zellner's (1962) seemingly unrelated regressions I test whether the previously identified events that led to the passage of the Codetermination Act in 1976 had significant wealth effects on the affected German firms. I form portfolios of firms based on the expected increase in the number of employee representatives on the board. The distribution of the changes in number of employee representatives allows for the formation of 6 portfolios. P1 consists of firms with no change in the number of employee representatives. It consists of 62 firms which can be calculated by adding up all 58 firms on the grey diagonal in Table II Panel B plus the 4 Montan companies. For the other portfolios the increase in the number of employee representatives and the number of firms in the portfolio (in parentheses) is: P2: 2 (N=8), P3: 3 (N=33), P4: 4 (N=18), and P5: 5 (N=8), P6: 6-8 (N=11). P6 includes all increases larger than 5 because observations for individual increases would be too small.

As the regression model I employ the market model with two dummy variables which represent the event dates. Although trading volume data is missing, the German stock market in 1970s can be assumed to have been illiquid. The use of infrequently traded stocks has been shown to introduce biases into parameter estimates (Dimson, 1979). To account for the non-trading bias, I use the approach suggested by Dimson (1979) by including two additional lead and two lagged market factors to control for non-synchronous trading.

$$r_{pt} = \beta_0 + \beta_1 r_{m,t-2} + \beta_2 r_{m,t-1} + \beta_3 r_{m,t} + \beta_4 r_{m,t+1} + \beta_5 r_{m,t+2} + \sum_{i=1}^{D} \gamma_{p_i} D_i + e_{pt} \qquad (1)$$

r_{pt} = day t return on the equally-weighted portfolio p (p = 1,…,6)

$r_{m,t-2}$ = 2-period lagged return on CDAX

$r_{m,t-1}$ = 1-period lagged return on CDAX

$r_{m,t}$ = contemporaneous return on CDAX

$r_{m,t+1}$ = 1-period leading return on CDAX

$r_{m,t+2}$ = 2-period leading return on CDAX

D_i = dummy variable equal one for the [-1,1] announcement window on event day i, for each of the D event days under consideration (D_i, i = 1,2) and zero otherwise. The coefficient to D_i (γ_{pi}) measures the abnormal return on portfolio p generated by event i.

The first Datastream return is available on 03 January 1973. The first testable announcement occurs on 20 February 1974. In order to avoid potential anticipated price movements, I estimate the regression parameters up to 60 days before this first announcement. Including the two lagged market returns, the estimation window starts 259 days before the first announce-

ment day and includes 198 trading days. Adding the 6 days of the event dates gives 204 observations.

3.5 Regression results

Table III presents the regression results of the 6 portfolios for the regression model given in equation (1). The portfolios were formed based on the expected increase in the number of employee representatives due to the Codetermination Act of 1976. In addition to 5 market return terms to control for infrequent trading, the main coefficients to look at are the two dummy variables which represent the [-1, 1] event window for the two chosen announcement dates explained in section 3.2.2: (1) 22 January 1974, when the government presented for the first time the main components for the Codetermination Act, (2) 18 March 1976, when the Codetermination Act was passed in the German Bundestag. The event date coefficients are only significant in the two largest portfolios with 5 (Portfolio 5) or more than 5 (Portfolio 6) additional labor representatives joining the board. Specifically, only the second event date coefficient is significant for Portfolio 5 and both coefficients are significant for Portfolio 6. The MRVM allows the testing of hypotheses in the time-series dimension by adding up all dummy variable coefficients to analyze the overall impact of the Codetermination Act. Summing up the abnormal returns over the two event windows gives an overall and significant wealth impact of the Codetermination Act of -0.59% for firms in which more than 5 additional labor representatives joined the board. Although the overall impact seems to be small it must be considered the coefficients represent only two event dates at the beginning and the end of a political debate which lasted for more than 2 years.

Instead of forming portfolios based on the expected number of additional labor representatives joining the board, I rerun the regression by forming portfolios based on the future minimum requirements for the supervisory board structure. The results are similar except that in the 6th portfolio only the second announcement date is highly significant at the 1% level. However, this portfolio approach can be seen as less accurate as it does not consider the previous supervisory board structure. A portfolio formation based on whether or not firms are affected by the Codetermination Act gives no significant results, at all.

The results suggest that by using the proper econometric model to analyze regulatory announcement effects, the Codetermination Act show negative wealth effects on firms. However, the mere fact of being affected by the new law is unimportant. What matters seems to be the 'forced' increase in labor representatives on the board. Therefore, in order to identify significant effects it is important to consider the previous board structure of the firms. Only those

companies which experienced an increase in employee representatives of more than 5 have experienced significant negative wealth effects.

3.6 Evidence from announcements directly after the passage of the Codetermination Act of 1976

As a robustness check I examine the announcement effects directly after the enactment of the Codetermination Act in 1976/77. The announcement regulation in Article 97 of the Stock Corporation Act requires the management of a corporation to publicly announce when its board structure changes. I collect announcements dates which include information on changes in board structures immediately after the enactment of the Codetermination in 1976 in the German Federal Gazette (*Bundesanzeiger*). It is a robustness check because I do not expect to find significant results. The expected changes should already be impounded in the stock prices during the period that led towards the passing of the Codetermination Act. In the publication "WSI-Mitteilungen" (henceforth WSI), companies are reported that have announced whether the new Codetermination Act applies to them. Based on the names provided, I searched in the Federal Gazette (*Bundesanzeiger*) for the announcement dates and what the minimum board structure requirement would be.

Out of the 140 sample companies from the regulatory event study, 81 firms made an announcement as reported by WSI. This also shows that the 78 firms which were expected to make an announcement based on the number of their domestic employees is a good approximation. In 14 firms, the BA content did not include information from which the future board structure could have been deduced. Therefore, I exclude these firms. I also exclude 2 firms for which I found a second announcement which reported that a court decision was required to whether the Codetermination Act would apply. Although this happens after the original announcement, the firm might have characteristics which made the market expect such a possibility. As a conservative measure, I exclude these three firms. I am unable to find announcements for 2 of them. Finally, 6 announcements occur on non-trading days and are excluded. The final testing sample includes 57 announcements. Among the 57 firms there are 14 firms in which the actual board structure did differ from the board structure expected in 1975. Table IV shows, however, that in 9 cases (marked in grey), the employee numbers were very close to one of the employee number thresholds as determined by the Codetermination Act.

To test whether abnormal returns have been significant, I employ the standard event study methodology based on the OLS market model using daily returns (Brown & Warner, 1985).[14] I estimate the market model 250 days prior to the [-2,2] event window. Similar to Brown and Warner (1985), for a security to be included in a sample it must have at least 30 daily returns in the estimation window and no missing return data in the last 20 days (including the event window). I adjusted for non-synchronous trading by including one lead and one lagged market factor into the market model based on Dimson (1979).

The results are presented in Table V. Panel A shows the CARs coefficients an increase or decrease in either board size or the number of labor representatives. The coefficients in Panel B represent the effect of a change in the number of labor representatives if the board size remains constant. Finally, in Panel C it is tested for significant wealth effects in firms in which the actual board size or the number of labor representatives on the board was different from what could have been inferred by the number of employee data available from *Hoppenstedt* in 1975. As expected, none of the coefficients are significant with one exception. There is a weak significant negative effect if the real board size in 1976 was smaller than the expected board size.

To avoid that the passage of the Codetermination Act contaminated the returns in the estimation window, I re-estimate abnormal returns using the estimation period in the regulatory event study. The estimation period includes 198 trading days and ends 60 days before the first announcement on 20 February 1974. This time, without exception all CARs remain insignificant.

4. The market reaction to exogenous changes in the supervisory board structure, 1998-2008

The passage of the Codetermination Act of 1976 lies more than 30 years behind and the regulatory event study in the previous section has analyzed the initial market reaction to the new law. In this section, I use a more recent dataset (1998-2008) to test whether the results still hold or if the effect of Codetermination on firms has potentially changed over time. In addition, employing a more recent dataset enables analyzing the effect of a changing board structure in firms that previously had no labor representatives on the board. In contrast to the time around the Codetermination Act of 1976, boards without labor representatives are possible in companies with fewer than 500 domestic employees that are founded *after* 10/08/1994, the

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[14] The returns are continuously compounded with reinvested dividends, using Datastream's RI datatype.

effective date of the law known as the *Gesetz fur kleine Aktiengesellschaften und zur Deregulierung des Aktienrechts* (Fauver & Fuerst, 2006, p. 675).

4.1 Data and sample construction

Based on the aforementioned Article 97 of the Stock Corporation Act, the management has to publicly announce changes in the supervisory board structure. These can be 'forced', by passing one of the thresholds for the number of domestic employees (see Table I), are voluntary. The announcements are accessible in an online version of the Trade Register (*Handelsregister*) via FACTIVA. I only record those announcements which I can match with firms that have stock returns available in Datastream. The first of such announcements I found on 18 January 1998 and the last announcement on 30 January 2008, yielding a 10 year sample period. However, the announcements available in the Trade Register are usually delayed by one day. To identify the earliest announcement, I start by recording the announcements in the print version of the Federal Gazette (*Bundesanzeiger*) in which all announcements used to be published. Online access to the content of the print version of the Federal Gazette requires payment but the announcement dates by companies can be seen. Since the announcements of the Trade Register are usually only delayed by one or two days, I am able to identify the event dates in the Federal Gazette for all announcements. In case there are deviations in the announcement dates, I take the earlier one of the two sources. I also record the dates available in the Electronic Federal Gazette (*elektronischer Bundesanzeiger*). The Electronic Federal Gazette exists in addition to the print version from 2003 onwards and can be accessed without charge. Usually, announcements are made in either the Federal Gazette or the Electronic Federal Gazette without overlap. Interestingly, however, in a very few cases with overlap the announcement in the print Federal Gazette appeared before its electronic counterpart. In addition, in some cases the Trade Register announcement appears before the Federal Gazette and/or the Electronic Federal Gazette announcement. Therefore, I use the earliest announcement date from the Trade Register, the Federal Gazette, or the Electronic Federal Gazette. I am able to identify 121 firms that made 149 announcements.

Of the 149 events, I exclude an additional 59 event because of the following: 24 events for which announcements occurred on a non-trading day, 6 events in which stock prices are still recorded after the firm's inactive date, 15 events. for which there was missing return data in the last 20 days (including the event window) and at least 30 returns missing in the estimation period, 5 events in which the supervisory board structure did not change (in 3 events, this happened after an IPO when the firm announced the composition of its SB for the first time after

being public but without changing the structure of its supervisory board. In 1 event, the announcement only concerns the number of union members among the employee representatives so that the SB size and number of labor representatives is not affected. In 1 event, the application of a law changes (from Montan-Codetermination to the Montan-Codetermination Supplementation Act (*Montan-Mitbestimmungs-Ergänzungsgesetz*) which does not affect the structure of the SB, however), 6 announcements with confounding events (in 5 evens, the supervisory board structure changes because of a merger. In a merger, the new board structure is usually announced in the merger talks but it is impossible to disentangle the stock price reaction to the merger news from the one about the future board structure. In 1 event, part of firm is spinned-off and went public afterwards. The future board structure was already discussed before the IPO at the time of the spin-off when no stock return data was available), and 3 events in which I was unable to identify the board structure before the announcement (this information is necessary to calculate the change in board structure). The final sample consists of 90 events.

The summary statistics and information on board structures of the sample firms are presented in Table VI. The distribution of firm sizes, measured by total assets, is heavily skewed to the right and firms in the sample are very small with mean (median) total assets of EUR12mio. (EUR763,000). In addition, ThomsonReuters does not report accounting information for all the sample firms. The relevant information for the following analysis is supervisory board size and the number of labor representatives on the board. The statistics in Table VI are shown for firms before they have made an announcement on board changes, after the announcement, and the changes in board structure. The numbers indicate that there are more firms in the sample in which the board size and the number of labor representatives was reduced. The mean sample board size is 9 with 3 labor representatives on the board (for the median, the equivalent numbers are 6 and 2, respectively).[15] A closer look at the distribution of board structures in Table VII shows that this sample includes 22 companies without any labor representatives on the board. In addition, the table highlights that in the range of up to 2,000 employees in the firm, companies do deviate positively from the regulatory minimum requirement. However, as soon as firms fall under the Codetermination Act of 1976 this positive deviation disappears.

In some announcements, firms did not disclose how the future board structure would look like. Often in these cases, the information would be found in the invitation for the following Annual General Meeting which has to decide on changes in the board structure by-laws. By

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[15] Fauver and Fuerst (2006) report a median board size of 9 for a sample of 786 German firms in 2003.

making assumptions similar to those from section 3.1 about the market's expectation about the future board structure at the time of the event, it is possible to keep the first announcement in the sample. As Table VII highlights, when companies are regulated by the Codetermination Act it is less likely to see deviations from the minimum board structure requirements. Accordingly, whenever a firm passes a regulatory threshold so that its future board size is determined by the Codetermination Act of 1976 I assume that market participants expect the firms to just fulfill that minimum requirement. However, whenever a firm passes a regulatory threshold based on the number of its employees below the 2,000 level (see Table I for a reminder), three assumptions are necessary.

First, if a firm had no labor representatives on its board and the number of its domestic employees rises from below 500 to 500-2,000 employees, I assume the size of the supervisory board to stay the same. Only the board composition will be adjusted to one-third labor representation. For example, if the firm consisted of three shareholder representatives only, I assume that after passing the regulatory threshold, the supervisory board will continue to consist of 3 members. However, the number of shareholder representatives reduces to 2 and 1 labor representative joins the board.

Second, if the number of domestic employees passes the regulatory threshold from above 2,000 employees to 501-2,000 employees it is less intuitive to predict the size of the supervisory board. The minimum required board size would be 3 but as Table VI shows the median board size after an announcement is 6. Accordingly, if firms do not disclose in their announcement how the future board structure will look like, I assume the announcement returns to reflect an expected board size of 6 with 2 labor representatives on the board.

Finally, in a firm that is founded after August 10, 1994, if the number of domestic employees drops from above 500 to below 500, the firm does not need any labor representatives. I assume that the market participants will expect the future board size to remain the same and only the number of labor representatives will reduce to 0.

4.2 Regression results

I analyze the cumulative abnormal returns for the following four scenarios. First, I examine the stock price reaction to changes in supervisory board size unconditional on the changes in the number of labor representatives. Second, I look at the price reaction to changes in the number of labor representatives unconditional on the changes in board size. To isolate the wealth effects of labor representatives, I analyze the stock price reaction in events when the number of labor representatives changes but board size remains unchanged. Fourth and fi-

nally, I look at the exact number of board members and/or labor representatives joining or leaving the board and test their significance.

I employ the standard event study methodology by estimating the market model 250 days prior to the event window. Three event windows are used for comparison reasons: [-2,2], [-1,1], and [0,1]. Similar to Brown and Warner (1985), for a security to be included in a sample it must have at least 30 daily returns in the estimation window and no missing return data in the last 20 days (including the event window). Since most of the firms are extremely small, I include one additional lead and one lag market return in the market model to account for a potential non-trading bias (Dimson, 1979).

Table VIII shows the announcement effect for unconditional changes in board size and number of employee representatives on the board. When the board size increases there is a negative but insignificant effect. When board size decreases, the effect is positive but of similar magnitude and significant at the 10% level. Therefore, the mere change in supervisory board size does not seem to have any effects on value of the firm and therefore shareholder wealth. When the number of employee representatives on the supervisory increases, on the other hand, the cumulative abnormal return over the [-2,2] event window is -2.57% and significant at the 5% level. If the number of employee representative decreases, the cumulative abnormal return is +2.71% and significant at the 1% level. Since these results are unconditional, the effect of a change in the number of employee representatives could be blurred by a simultaneous change in the size of the supervisory board. In addition, it is interesting to see whether the effect differs in firms that previously had not been codetermined, or in firms that had employee representatives on the board, but are not codetermined anymore.

Table IX contains the results from conditional announcement effects. Panel A of Table IX shows abnormal announcement returns that result from changes in the number of labor representatives on the board when overall board size does not change. A situation like this can happen in two instances. First, the company has less than 500 employees, was founded after 10 August 1994, and therefore does not have labor representatives on the board. Once the firm passes the 500 employee threshold, one-third labor representation on the board is required. Thus, board size would not change but the number of labor representatives would change from zero to one-third of the board size of the respective firm. In a second instance, a company could be regulated by the Works Constitution Act with one-third labor representation. Instead of fulfilling the minimum requirement of 3 board members, the firm might have established a board size of 12 of which 4 are labor representatives. If the number of domestic employees in the firm increases above 2,000, the company will be regulated by the Codetermina-

tion Act with a board consisting of 12 members. Since the firm already had a board size of 12, only the number of labor representatives would increase by two to fulfill the regulatory requirements but board size would stay the same.[16] Including the restriction of constant board size into the regression model reduces the sample observations when the number of labor representatives on the board increases or decreases to 12 and 16, respectively. Taking out the effect of changing board size increases the magnitude of the coefficients considerably. An increase in the number of labor representatives leads to a negative cumulative abnormal return of -4.85% over the 5-day announcement window (Panel A of Table IX). An announced decrease in labor representatives with constant board size leads to a positive cumulative abnormal return of 4.46%. In both cases, the coefficients are significant at the 5% levels. The first regression in Panel B of Table IX shows the CARs if at least one employee representative joins a board that previously had not been codetermined. Likewise, the second regression in the panel shows the CARs if at least two employee representatives join a board that previously had not been codetermined. Further increases in the minimum number of employee representatives joining the board are infeasible because of limited data availability. The results show the highest CAR of 5.15% over the 5-days window, when more than 1 employee representative joins a board that previously had been undetermined. The results lend support to the notion that the initial set-up of codetermination poses significant costs to the firm, potentially through a changed objective function of the firm which requires higher coordination and negotiation efforts. To mirror the above analysis, Panel C of Table IX reports the announcement returns to the change in the number of employee representatives on the board so that the board will not be codetermined anymore. Similarly, the results are now significant and positive with the highest CARs over the 5-day announcement window if more than 1 labor representative leaves the board.

5. Conclusion

This study tackles one of the most puzzling but unresolved questions in corporate governance research by providing the first empirical evidence that the initiation of codetermination in the firm significantly reduces shareholder wealth.

The participation of labor in the supervision of the firm without necessarily owning voting rights, commonly called codetermination, is a fascinating issue in corporate governance re-

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[16] The opposite, i.e. an increase in board size while the number of employee representatives on the board remains constant, is not possible. This is so because the law prescribes the number of employee representatives on the board as a fraction of overall board size. One exception is when the number of employee representatives on the board is zero, i.e. when the company does not fall under any of the codetermination laws by having less then 500 employees, being founded after 10 August 1994, and by not being a company in a Montan-industry.

search. Theoretical papers which include the interests of employees and their potentially different objective function into corporate decision making are rare. Empirical studies that focused on Germany have usually been suffering from an institutional drawback which has biased the statistical results: in Germany, the law requires more labor representatives on the board in firms that have more employees working in Germany. Thus, it had been impossible to isolate the effect of firm size from the effect of codetermination on firm value when panel datasets are used. With two unique hand-collected datasets I am able to tackle the issue by making use of two event study methodologies. First, I employ a regulatory event study at the time when the Codetermination Act of 1976 was passed. I find significant negative announcement returns for companies in which 5 or more additional labor representatives had to join the supervisory board which already was codetermined. Second, I use a more recent dataset for the period 1998-2008 and analyze company announcement about changes in board size and/or the number of labor representatives on the board. For this most recent time period, I find the abnormal returns to be large and negative when labor representatives join a board that previously was not codetermined. The results are significantly positive and of almost equal size if labor representatives leave a board that will not be codetermined in the future. The latter results indicate that only the initial entry of labor representatives to the board matters. Once labor representatives are on the board, a further increase in their number does not lead to additional significant negative abnormal returns. The evidence suggests that the initial implementation of codetermination poses significant coordination and negotiation costs to the firm.

The fact that in 1976 only companies in which 5 or more labor representatives joined a previously already codetermined board experienced significant negative abnormal returns, whereas from 1998-2008 significant negative abnormal returns are only found if labor representatives join a board that previously was not codetermined gives rise to different hypotheses. First, the initial market response in 1976 might have been an overreaction. Over time investors may have realized that having many labor representatives on the board at least does not negatively affect firm performance. Second, and related to this point, it may well be that the initial market reaction was correct but over time companies might have found ways to neutralize the negative effect of having many labor representatives on the board. However, it must be noted that all companies in 1976 had already been codetermined. Thus, the effect of additional labor representatives on a board that was previously not codetermined in 1976 is impossible to test. The respective law that allows this analysis was passed in 1994. In addition, having 5 ore more labor representatives joining the board at once as in 1976 is only happing in very rare occasions nowadays. For the period 1998-2008 the sample includes 6 events

in which 6 labor representatives joined a board that previously was not codetermined but the results are not significant. In 1976 there were 19 events with 5 ore more additional labor representatives joining the board. The further exploration of these questions is left for future research.

Appendix

A.1 Event dates leading to the Codetermination Act 1976

Already in 1962 when the Stock Corporation Act was revised, the German Federation of Trade Unions (*Deutscher Gewerkschaftsbund*) prepared a bill which aimed at extending Montan-parity-codetermination to all companies in Germany. However, for these early periods only the year and at best the month is given. In the following I list the most significant dates that are related to the Codetermination Act of 1976 and for which an exact date is identifiable.

Date	Description	Source
18 January 1973	Chancellor Willy Brandt proclaims in his government declaration that the Montan-Codetermination existent at that time would be extended but without giving specific details, yet.	Hans-Boeckler-Stiftung
22 January 1974	The coalition parties SPD and FDP agree on a common model for the extension of Montan-Codetermination to all other industries.	Zeit 05/1974, p.8
20 February 1974	Secretary of Labor, Walter Arendt, presents a government bill for the Codetermination Act.	Hans-Boeckler-Stiftung
22 March 1974	The employers' federations, representing around 3,000 companies, demonstrate in Cologne against the Codetermination Act.	Hans-Boeckler-Stiftung
20. June 1974	Debate in the German Parliament about the government bill for the Codetermination Act.	Hans-Boeckler-Stiftung
08 December 1975	Official presentation of the second government bill which represents a compromise between the coalition parties SPD and FDP on the critical Codetermination issues ("Codetermination Compromise").	Hans-Boeckler-Stiftung
18 February 1976	Council for Works and Social Order gathers for the last time to discuss the government bill for the Codetermination Act and votes on amendments suggested by the CDU/CSU party.	Parliamentary archive, Drs. 7/4845, S. 3
23 February 1976	Council for Works and Social Order presents its new version of the Codetermination Act based on the initial government bill and including its suggested changes based on the polls taken on 18 February 1976.	Parliamentary archive, Drs. 7/4787
10 March 1976	Council for Works and Social Order reports on the government bill and explains the changes that have been made compared to the initial bill.	Parliamentary archive, Drs. 7/4845
18 March 1976	Debate in and passage of the Codetermination Act by the German Parliament with 389 votes and 22 votes against the Codetermination Act.	Hans-Boeckler-Stiftung
01 March 1979	The Federal Constitutional Court declares that the Codetermination Act does not violate the constitution.	Hans-Boeckler-Stiftung

A.2 The legal requirements of the Stock Corporation Act for announcements on changes in the size and composition of the supervisory board

Art. 95 Number of supervisory board members (*Zahl der Aufsichtsratsmitglieder*)

The supervisory board consists of three members. The by-laws can define a bigger size. It must be divisible by three. The maximum number of supervisory board members in companies with shareholder's equity

Shareholder's Equity   Max. board size

Up to	1,500,000 EUR	9,
More than	1,500,000 EUR	15,
More than	10,000,000 EUR	21.

This law does not affect deviated requirements in the Montan-Codetermination Act of 1951 or the Codetermination Act of 1976.

Art. 96 Composition of the supervisory board (*Zusammensetzung des Aufsichtsrats*)

Art. 96 describes the composition of the supervisory board based on all laws other than the Stock Corporation Act. In line 6 it is stated that "in all other companies, the supervisory board is only composed of shareholder representatives" [own remark: 'all other companies' are those with less than 500 employees and founded after 10 August, 1994].

Art. 97 Announcement on the composition of the supervisory board (*Bekanntmachung ueber die Zusammensetzung des Aufsichtsrats*)

Art. 97 paragraph 1 is the main building block which made the analysis in this paper possible. As soon as the management board notices that the composition of the supervisory board is not in accordance with the law, it must publish a statement in the (electronic) Federal Gazette (*Bundesanzeiger*) (Art. 25) and name the new laws that will apply. According to paragraph 2 there is a one month period for filing an appeal to the company's intention of changing the size and composition of the supervisory board. Within six months after the end of the period for objection, the bylaws have to be changed and adapted to allow for the new board structure.

Art. 98 Legal ruling over the composition of the supervisory board (*Gerichtliche Entscheidung über die Zusammensetzung des Aufsichtsrats*)

If it is uncertain according to which laws the supervisory board has to be composed of, the decision will be made by the state court where the company is located, if a request has been made [own comment: in paragraph 2, the law also provides a list on who can file a request with the state court].

Art. 106 Announcement on changes in the supervisory board (*Bekanntmachung der Änderungen im Aufsichtsrat*)

Whenever people join or leave the supervisory board, the management board has to submit immediately a list to the Trade Register (*Handelsregister*) which reports the members of the supervisory board, their names, job, and personal address. The court [which administers the

Trade Register] has to publish a note which indicates that the list had been submitted to the Trade Register.

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Tables

Table I
Legal requirements for board structures in Germany

This table summarizes the legal requirements for supervisory board size and labor representation on the supervisory board in Germany. The number of a firm's employees working in Germany determines its minimum board size. The supervisory board size again determines the number of labor representatives (*labor reps*) on the supervisory board based on a ratio specified in the respective laws. The '*Montan*' industry includes the iron, coal, and steel industry.

Number of employees in Germany	Minimum board size	Ratio of labor reps to board size	Industry	Special requirements	Law effective
1,000 - ∞	15	1/2 + 1 neutral member	Montan		Montan-Codetermination Act (1951)
0-500	3	0	All but Montan	If foundation after 10/08/1994 or if family business	Small Company and Deregulation Act (1994)
501-2,000	3	1/3	All but Montan	If foundation after 10/08/1994	Works Constitution Act (1952)
0-2,000	3	1/3	All but Montan	If foundation before 10/08/1994	Works Constitution Act (1952)
2,001-10,000	12	1/2	All but Montan		Codetermination Act (1976)
10,001-20,000	16	1/2	All but Montan		Codetermination Act (1976)
20,001-…	20	1/2	All but Montan		Codetermination Act (1976)

Table II

Real and expected supervisory board structures in Germany in before and after 1976

This table displays the real distribution of supervisory board structures in Germany in 1975 (Panel A) and the expected distribution of supervisory board structures after the passage of the Codetermination Act in 1976 (Panel B). The term *board structure* refers to the size of the supervisory board and the number of labor representatives (*labor reps*) on the supervisory board. The expected board structures are estimated based on the number of domestic employees in the respective firms in 1975. Grey cells with black numbers are companies that are governed by the *Works Constitution Act* of 1952 which requires the number of labor representatives (*# labor reps*) to be 1/3 of board size. Framed white cells represent companies in the coal, iron or steel industry that fall under the *Montan-Codetermination Act* which requires 50% labor representation plus one neutral member. Black cells are companies that are expected to fall under the new *Codetermination Act* of 1976 with 50% labor representation on the board. The mean and median board size and number of labor reps for before and after 1976 is presented below each panel.

Number of labor representatives on the supervisory board

Panel A: Real distribution of board structures in 1975

Board size	0	1	2	3	4	5	6	7	8	9	10	Total
3	-	1	-	-	-	-	-	-	-	-	-	1
6	-	-	37	-	-	-	-	-	-	-	-	37
9	-	-	-	37	-	-	-	-	-	-	-	37
12	-	-	-	-	27	-	-	-	-	-	-	27
15	-	-	-	-	-	18	-	-	-	-	-	18
18	-	-	-	-	-	-	4	-	-	-	-	4
21	-	-	-	-	-	-	-	12	-	-	4	16
Total	0	1	37	37	27	18	4	12	-	-	4	140

Mean board size / mean # labor reps: 11.14 / 3.94
Median board size / mean # labor reps: 9 / 3

Panel B: Expected distribution of board structures after the Codetermination Act of 1976

Board size	0	1	2	3	4	5	6	7	8	9	10	Total
3	-	1	-	-	-	-	-	-	-	-	-	1
6	-	-	22	-	-	-	-	-	-	-	-	22
9	-	-	-	17	-	-	-	-	-	-	-	17
12	-	-	-	-	10	-	36	-	-	-	-	46
15	-	-	-	-	-	4	-	-	-	-	-	4
16	-	-	-	-	-	-	-	-	13	-	-	13
18	-	-	-	-	-	-	2	-	-	-	-	2
20	-	-	-	-	-	-	-	-	-	-	29	29
21	-	-	-	-	-	-	-	2	-	-	4	6
Total	0	1	22	17	10	4	38	2	13	-	33	140

Mean board size / mean # labor reps: 13.21 / 5.94
Median board size / mean # labor reps: 12 / 6

Black	Works Constitution Act: # labor reps 1/3 of board size	
White	Codetermination Act: # labor reps 1/2 of board size	
Black	Montan-Codetermination Act: # labor reps 1/2 of board size + 1 neutral member	

Table III

Regulatory event study

This table presents multivariate regression results from the regulatory event study based seemingly unrelated regressions (SUR) (Zellner, 1962) estimated via OLS. 140 firms are split up into different portfolios based on their expected increase in labor representatives on the supervisory board (*labor reps*). Each portfolio represents a weighted average of the daily stock returns of its N constituent firms. The regression parameters are estimated up to 60 days before the first announcement which occurred on 20 February 1974. Each portfolio includes 204 observations. *, **, and *** denotes significance at the 10%, 5%, and 1% levels, respectively.

The following regression model is tested:

$$r_{pt} = \beta_0 + \beta_1 r_{m,t-2} + \beta_2 r_{m,t-1} + \beta_3 r_{m,t} + \beta_4 r_{m,t+1} + \beta_5 r_{m,t+2} + \sum_{i=1}^{D} \gamma_{pi} D_i + e_{pt}$$

r_{pt}	= day t return on the equally-weighted portfolio p (p = 1,…,6)
$r_{m,t-2}$	= 2-period lagged return on CDAX
$r_{m,t-1}$	= 1-period lagged return on CDAX
$r_{m,t}$	= contemporaneous return on CDAX
$r_{m,t+1}$	= 1-period leading return on CDAX
$r_{m,t+2}$	= 2-period leading return on CDAX
D_i	= dummy variable equal one for the [-1,1] announcement window on event day i, for each of the D event days under consideration (D_i, i = 1,2) and zero otherwise.

The coefficient to D_i (γ_{pi}) measures the abnormal return on portfolio p generated by event i.

Robust standard errors are estimated by the Eicker-Huber-White-sandwich covariance estimator and are shown in parentheses. For the F-test about the overall impact of both announcement dates, the chi-squared test-statistic is shown in parentheses.

	Dependent variable: portfolio return					
	Increase in labor representatives=0	Increase in labor representatives=2	Increase in labor representatives=3	Increase in labor representatives=4	Increase in labor representatives=5	Increase in labor representatives>5
	(N=62)	(N=8)	(N=33)	(N=18)	(N=8)	(N=11)
Control variables						
Market return t-2	0.1046 ***	0.0425	-0.0206	0.0787	-0.0386	-0.1354 ***
	(0.0247)	(0.0713)	(0.0457)	(0.0499)	(0.0630)	(0.0511)
Market return t-1	0.1434 ***	0.1486 **	0.0762 *	0.1758 ***	-0.2545 ***	0.0138
	(0.0295)	(0.0697)	(0.0440)	(0.0508)	(0.0646)	(0.0570)
Market return t	0.5519 ***	0.8459 ***	0.9588 ***	0.8441 ***	1.3521 ***	1.0331 ***
	(0.0387)	(0.0990)	(0.04275)	(0.0572)	(0.0610)	(0.0505)
Market return t+1	0.0268	-0.1411 *	-0.0258	0.0035	-0.0329	0.1239 ***
	(0.0321)	(0.0770)	(0.0409)	(0.0600)	(0.0583)	(0.0438)
Market return t+2	-0.0079	0.0866	-0.0225	0.0145	-0.0033	-0.0557
	(0.0253)	(0.0746)	(0.0343)	(0.0490)	(0.0536)	(0.0474)
Event dates						
$\gamma_{p1} D_1$	0.0000	-0.0012	0.0006	0.0000	-0.0008	-0.0019 **
(Gov't presents first draft)	(0.0008)	(0.001324)	(0.0010)	(0.0006)	(0.0034)	(0.0007)
$\gamma_{p2} D_2$	-0.0001	-0.0008	-0.0006	-0.0008	-0.0031 **	-0.0039 ***
(Parliament passes bill)	(0.0006)	(0.003489)	(0.0017)	(0.0013)	(0.0012)	(0.0015)
$\gamma_{p1}+\gamma_{p2}$	-0.0001	-0.0021	0.0000	-0.0008	-0.0039	-0.0059 ***
Chi2	(0.01)	(0.30)	(0.00)	(0.26)	(1.14)	(11.82)

Table IV
Expected and real board size in 1976

This table shows the 14 firms in which the expected board size for 1976 deviated from the real board size as it was announced in the Bundesanzeiger (*BA*), the Federal Gazette. The expected board size for 1976 was estimated based on the number of firm employees in 1975 which determines the applicability of one of the Codetermination laws presented in Table I. The number of firm employees in 1975 is taken from *Hoppenstedt* which does not differentiate into domestic and foreign firm employees. The real board size is identified via the *Bundesanzeiger*, in which companies are obliged to make changes in their board structure public. Marked in grey are the 9 companies in which the number of firm employees in 1975 was very close to the next Codetermination threshold. Market participants may have already expected the firm to pass the threshold in the near future which might help explain the deviation between expected and real boar size.

Expected board size for 1976	Real board size announced in BA	Number of firm employees in 1975
6	12	1,148
9	12	1,973
9	12	1,929
9	12	1,894
12	16	4,263
12	16	9,691
16	12	2,940
16	12	6,631
16	20	18,878
16	12	9,296
20	16	22,400
20	16	9,086
20	16	19,005
21	20	6,793

Table V

Abnormal announcement returns on changes in supervisory board structures in 1976

Estimates of cumulative abnormal returns (CARs) over the [-2,2] event window based on announcements about board structure changes after the enactment of the Codetermination Act on 01 July 1976. Expected returns are estimated by the market model during the 250 days prior to the event window. For a security to be included in a sample it must have at least 30 daily returns in the estimation window and no missing return data in the last 20 days (including the event window). To account for non-trading bias one additional lead and one lag market return are included in the market model (Dimson, 1979). Changes in board structure, represented by the symbol Δ, refers to changes in board size or changes in the number (#) of labor representatives, or both. *Panel A* presents estimates for unconditional changes in board size or the number of labor representatives. *Panel B* shows the CARs for changes in the number of labor representatives if the board size does not change. *Panel C* analyzes whether the deviation between the expected board size and number of labor representatives (# *labor reps*) on the board for 1976 and the real board structure in 1976 is a data problem or if the market was indeed surprised by it. The expected board structure for 1976 was estimated based on the number of firm employees in 1975 which determines the applicability of one of the Codetermination laws presented in Table I. The number of firm employees in 1975 is taken from *Hoppenstedt* which does not differentiate into domestic and foreign firm employees. It can also serve as a proxy for domestic employees. The real board structure is identified via the *Bundesanzeiger*, the Federal Gazette, in which companies are obliged to make changes in their board structure public. Standard errors are in parentheses. *, **, and *** denotes significance at the 10%, 5%, and 1% levels, respectively.

Change in board structure	[-2,2] event window	
	Coef	Obs
Panel A: Unconditional board structure changes		
Δ board size > 0	-0.0043	40
	(0.0042)	
Δ board size < 0	-0.0053	11
	(0.0040)	
Δ # labor representatives > 0	-0.0041	56
	(0.0031)	
Δ # labor representatives < 0	-	0
	-	
Panel B: Changes in # labor representatives if board size does not change		
Δ # labor representatives > 0	-0.0007	7
	(0.0048)	
Δ # labor representatives < 0	-	0
	-	
Panel C: Comparision of real board structure in 1976 to expected board structure for 1976		
Real board size 1976 > expected board size for 1976	0.0027	7
	(0.0116)	
Real board size 1976 < expected board size for 1976	-0.0109 *	6
	(0.0050)	
Real # labor reps 1976 > expected # labor reps for 1976	0.0027	7
	(0.0116)	
Real # labor reps 1976 < expected # labor reps for 1976	-	0
	-	

Table VI

Summary statistics for firm characteristics and board structures, 1998-2008

This table shows the descriptive sample statistics for 90 German public firms that announced a change in their supervisory board structure during the 1998-2008 period. Firm announcements are identified via FACTIVA, return data and total assets are from ThomsonReuters' Datastream/Worldscope. *Market return* is the daily return of the CDAX performance index. *Board structure* refers to the German supervisory board and includes the supervisory board size (*SB size*) and the number of labor representatives on the board (*# labor representatives*). The change in board structure, denoted by *Δ*, is calculated by subtracting the supervisory board size or the number of labor representatives before the announcement from the values after the announcement.

Variable	# firms	Mean	Median	Std. dev.	Min	Max
Total assets (in '000 EUR)	53	12,000	763	41,100	0.3760	214,000
Stock return	90	0.0002	0.0000	0.0345	-0.6436	1.0692
Market return (CDAX)	90	0.0003	0.0010	0.0138	-0.0748	0.0685
Board structure (before announcement)						
SB size	90	9.28	7.50	4.83	3.00	20.00
# labor representatives	90	3.60	2.00	3.17	0.00	10.00
Board structure (after announcement)						
SB size	90	8.73	6.00	4.70	3.00	20.00
# labor representatives	90	3.31	2.00	3.07	0.00	10.00
Change in board structure						
Δ board size	90	-0.54	0.00	5.09	-14.00	17.00
Δ # labor representatives	90	-0.29	-1.00	3.63	-10.00	10.00

Table VII

Distribution of supervisory board structures in Germany, 1998-2008

This table displays the distribution of supervisory board structures in Germany for 90 firms before they made an announcement about a change in their board structure during the 1998-2008 period. The term *board structure* refers to the size of the supervisory board and the number (#) of labor representatives on the supervisory board. Grey cells with white numbers are companies that fall under the Small Company and Deregulation Act, i.e. they have less then 500 domestic employees and are founded after 10 August, 1994. Grey cells with black numbers are companies that are governed by the *Works Constitution Act* of 1952 which requires the number of labor representatives (# *labor reps*) to be 1/3 of board size. Framed white cells represent companies in the coal, iron or steel industry that fall under the *Montan-Codetermination Act* which requires 50% labor representation plus one neutral member. Black cells are companies that are expected to fall under the *Codetermination Act* of 1976 with 50% labor representation on the board.

Board size (before change)	# of labor representatives on the board (before change)											Total
	0	1	2	3	4	5	6	7	8	9	10	
3	6	6	-	-	-	-	-	-	-	-	-	12
6	15	-	18	-	-	-	-	-	-	-	-	33
9	1	-	-	6	-	-	-	-	-	-	-	7
12	-	-	-	-	1	-	23	-	-	-	-	24
15	-	-	-	-	-	1	-	1	-	-	-	2
16	-	-	-	-	-	-	-	-	5	-	-	5
18	-	-	-	-	-	-	-	-	-	-	-	0
20	-	-	-	-	-	-	-	-	-	-	7	7
21	-	-	-	-	-	-	-	-	-	-	-	0
Total	22	6	18	6	1	1	23	1	5	0	7	90

White	Small Company and Deregulation Act: 0 labor reps
Black	Works Constitution Act: # labor reps 1/3 of board size
White	Codetermination Act: # labor reps 1/2 of board size
Black	Montan-Codetermination Act: # labor reps 1/2 of board size + 1 neutral member

Table VIII

Abnormal unconditional announcement returns on changes in supervisory board structures, 1998-2008

Estimates of cumulative abnormal returns (CARs) based on announcements about board structure changes during the 1998-2008 period. Presented are estimates for unconditional changes in board size or the number of labor representatives. Expected returns are estimated by the market model during the 250 days prior to the event window. Three event windows are used for comparison reasons: [-2,2], [-1,1], and [0,1]. For a security to be included in a sample it must have at least 30 daily returns in the estimation window and no missing return data in the last 20 days (including the event window). To account for non-trading bias one additional lead and one lag market return are included in the market model (Dimson, 1979). Changes in board structure, represented by the symbol Δ, refers to changes in board size or changes in the number (#) of labor representatives, or both. The number of observations (Obs.) in each regression is shown in the column to the right of the CAR estimates. Standard errors are in parentheses. *, **, and *** denotes significance at the 10%, 5%, and 1% levels, respectively.

Change in board structure	[-2,2] event window		[-1,1] event window		[0,1] event window	
	CAR	Obs.	CAR	Obs.	CAR	Obs.
Panel A: Unconditional board structure changes						
Δ board size > 0	-0.0147	27	-0.0186 *	27	-0.0157 *	27
	(0.0132)		(0..0103)		(0.0076)	
Δ board size < 0	0.0176 *	34	0.0103	34	0.0101 *	34
	(0.0093)		(0.0061)		(0.0053)	
Δ # labor representatives > 0	-0.0257 **	38	-0.0200 **	38	-0.0123 *	38
	(0.0110)		(0.0077)		(0.0066)	
Δ # labor representatives < 0	0.0271 ***	48	0.0152 **	48	0.0147 **	48
	(0.0086)		(0.0065)		(0.0066)	

Table IX

Abnormal conditional announcement returns on changes in supervisory board structures, 1998-2008

Estimates of cumulative abnormal returns (CARs) based on announcements about board structure changes during the 1998-2008 period. Expected returns are estimated by the market model during the 250 days prior to the event window. Three event windows are used for comparison reasons: [-2,2], [-1,1], and [0,1]. For a security to be included in a sample it must have at least 30 daily returns in the estimation window and no missing return data in the last 20 days (including the event window). To account for non-trading bias one additional lead and one lag market return are included in the market model (Dimson, 1979). Changes in board structure, represented by the symbol Δ, refers to changes in board size or changes in the number (#) of labor representatives, or both. *Panel A* shows the CARs for changes in the number of labor representatives if the board size does not change. *Panel B* presents CARs estimates for changes in the number of labor representatives if the board had previously not been codetermined. *Panel B* reports CARs estimates for changes in the number of labor representatives if the new board will not be codetermined. The number of observations (Obs.) in each regression is shown in the column to the right of the CAR estimates. Standard errors are in parentheses. *, **, and *** denotes significance at the 10%, 5%, and 1% levels, respectively.

Change in board structure	[-2,2] event window		[-1,1] event window		[0,1] event window	
	CAR	Obs.	CAR	Obs.	CAR	Obs.
Panel A: Changes in # labor representatives if board size does not change						
Δ # labor representatives > 0	-0.0485 **	12	-0.0220 **	12	-0.0063	12
	(0.0168)		(0.0090)		(0.0122)	
Δ # labor representatives < 0	0.0446 **	16	0.0248	16	0.0240	16
	(0.0162)		(0.0146)		(0.0162)	
Panel B: Changes in # labor representatives if old # labor representatives had been zero						
new # labor representatives > 0	-0.0496 **	19	-0.0321 **	19	-0.0186	19
	(0.0189)		(0.01237)		(0.01137)	
new # labor representatives > 1	-0.0515 **	17	-0.0358 **	17	-0.0263 **	17
	(0.02098)		(0.01358)		(0.01042)	
Panel C: Changes in # labor representatives if new # labor representatives is zero						
old # labor representatives > 0	0.0401 **	21	0.0193 *	21	0.0191	21
	(0.0144)		(0.0110)		(0.0117)	
old # labor representatives > 1	0.0442 **	15	0.0114	15	0.0102	15
	(0.0188)		(0.0099)		(0.0104)	